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Occurrence of Oriental Bonito (*Sarda orientalis* Temminck & Schlegel) in the Inshore Waters of Ceylon

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Introduction

The oriental bonito (*Sarda Orientalis* T & S), locally known as thora-baleya, is the least abundant species of the bloodfish group commercially exploited from the inshore waters of Ceylon. The occurrence of this species in Ceylon waters has not been reported and hence it was considered valuable to present the observations on this species, made in the course of the investigations into the more abundant relatives of this fish, in this preliminary report.

In 1964 not more than few hundred pounds of this species was caught from the inshore waters of Ceylon. Since the popularisation of drift-nets for bloodfish fishery in the south, south-west and/west coasts of Ceylon, it is estimated that the annual production has risen to about one ton.

Distribution

In the Indian Ocean, this species has been reported to be present off the east coast of South Africa, Seychelles, Somalia, Gulf of Aden, south-west coast of Australia and off the west coast of India but no reports of its presence off the east coast of India, Andamans sea or even around the Lacadive islands (Silas, 1962). Close to Ceylon this species appears in the commercial catches off the west, south-west, south and the north-east coasts.

For the purpose of comparing with specimens from Indian waters, meristic counts were made on eighteen specimens of Sarda from Ceylon waters and from size groups 22–28 cm. 30–40 cm. and 40–50 cm. in fork-length. It was observed that significant variations in the counts occur within size groups but not between size groups. There was also considerable difficulty in accommodating the gill-raker at the angle of the gill-arch, with those on either the upper or lower limb of the arch and in three of the specimens examined the number of gill-rakers present on the left and right side gill arches of the same fish exhibited a difference of more than one. The nonfunctional gill-rakers or protruberances on the arch varied between one and four and in the counts these were also included because it reduced the variability of the gill-raker counts (Table I).

TABLE I

MERISTIC COUNTS OF SARDA ORIENTALIS FROM THE CENTRAL INDIAN OCEAN

Area	D_1	D_2	*D finlets*	P_1	*A*	*A finlets*	*Gill-rakers*
Coast of India Day (1878)	XVIII	3, 13	8	24	3, 12	6	—
S. west coast of India Silas (1962)	XVII–XIX	14–16	7–8	23–25	13–16	5–7	1–4+8–10 (=9–14)
Coast of Ceylon Author (1968)	XVIII–XIX	13–16	7–8	23–25	13–16	6–7	3–4+1+7–9 (=11–14)
Most common values	XVIII	13	8	24	14	6	12

Though only stray catches are made around Ceylon, a noticeable difference in the frequency of appearance of this fish in the catches from different areas was seen. Sarda has been observed frequently in the bloodfish catches from the south coast and to a slightly lesser extent from the west and north-west coasts. In the south-west and north-east coasts, the frequency of occurrence is relatively low.

Size Composition

From the landings, the maximum and minimum fork-lengths observed were 50 cm. (3·5 lb.) and 20 cm. (0·25 lb.), respectively. The size range commonly caught lies between 25 cm. and 48 cm. The specimens below 25 cm. were juveniles with vertical dark bands in the process of transforming into horizontal black stripes (Plate I). The production being poor, only a few fish were available for length-frequency sampling from each area and from these samplings it appears that there are distinct differences in the size compositions, between areas. The model group shifts from the smaller, fish (under 30 cm.) caught frequently off the west coast to the larger size groups towards the south and north-east coasts (Fig. 1). Fish over 45 cm. fork-length have been caught more frequently off the south-western corner of Ceylon and the juveniles have appeared in the catches commonly off the west and north-west coast and very occasionally off the south coast too.

Length-weight relationship was determined for this species in Ceylon waters (Sivasubramaniam 1968) and the regression equation derived is expressed as follows :—

$$\text{Log } Y = 2{\cdot}9582 \quad \text{Log } X - 3{\cdot}2697 \quad \text{or } Y = 5{\cdot}375 \times 10 - 4 \text{ X } 2{\cdot}958.$$

Fishing season

Sarda appears in commercial catches almost throughout the year, especially off the south coast Mature fish are caught off the south and south-west coasts mainly between September and February while the juveniles appear off the west coast more often during the south-west monsoon season(June–August). In the north-east coast, mature fish have been caught during the same season. Off the west coast of India, a minor fishery for Sarda exists mainly between June and September (Silas, 1962).

Fish behaviour and fishing gears

Almost the entire catch of bonito from Ceylon waters is made with drift-nets operated for other bloodfish varieties. Sarda is very seldom seen in surface schools of mixed tuna species and has been extremely rare in troll catches. Even when they have been caught from mixed schools, the catch number never exceeded six. This species has been caught from fishing grounds about three miles from the shore and unlike the frigate mackerel (*Auxis thazard* and *A. rochei*) or mackerel tuna (*Euthynnus affinis*), very few of them have been caught in the beach-seine. Sarda has often appeared in the drift-net catches off the south and south-west coasts on new-moon nights. These drift-nets operated for the bloodfish varieties have a stretched-mesh size of 4″ to 5·5″ but even the juveniles of Sarda with a girth of 12 cm. also get caught. At the time of hauling, these juveniles like those of mackerel tuna (*Euthynnus affinis*) are found dead with the mouth gripping tightly on the webbing. Quite often these nets become luminescent under water due to the presence of micro-organisms like luminous bacteria or noctiluca in these fishing grounds and probably the juveniles were attracted by it.

Examination of the stomachs of this species caught with drift-nets operated at night showed that about seventy per cent of the stomachs were empty. Analysis of the food items found in the balance thirty per cent (eleven stomachs) indicated that nearly sixty per cent by volume of food consisted of clupeid fish, eighteen per cent of cephalopod mollusc (Squid and octopus), fifteen per cent of decapod crustacea and seven per cent of various other items including unidentified fishes. Pole and line method of fishing is popular in the south and south-west coasts during the north-east monsoon season when the mature bonito is also caught off these coasts, yet, Sarda is seldom seen in the catches made with this gear.

Relatively, the drift-net seems to be more effective for this species and the increase in production realised, however small it may be, may have been due to the increase in the operation of drift-nets in the areas where this species is frequently caught. However, no fishing effort is concentrated on this species and the apparent abundance is so low that it is not worth attempting to develop a fishery for this species.

Literature cited

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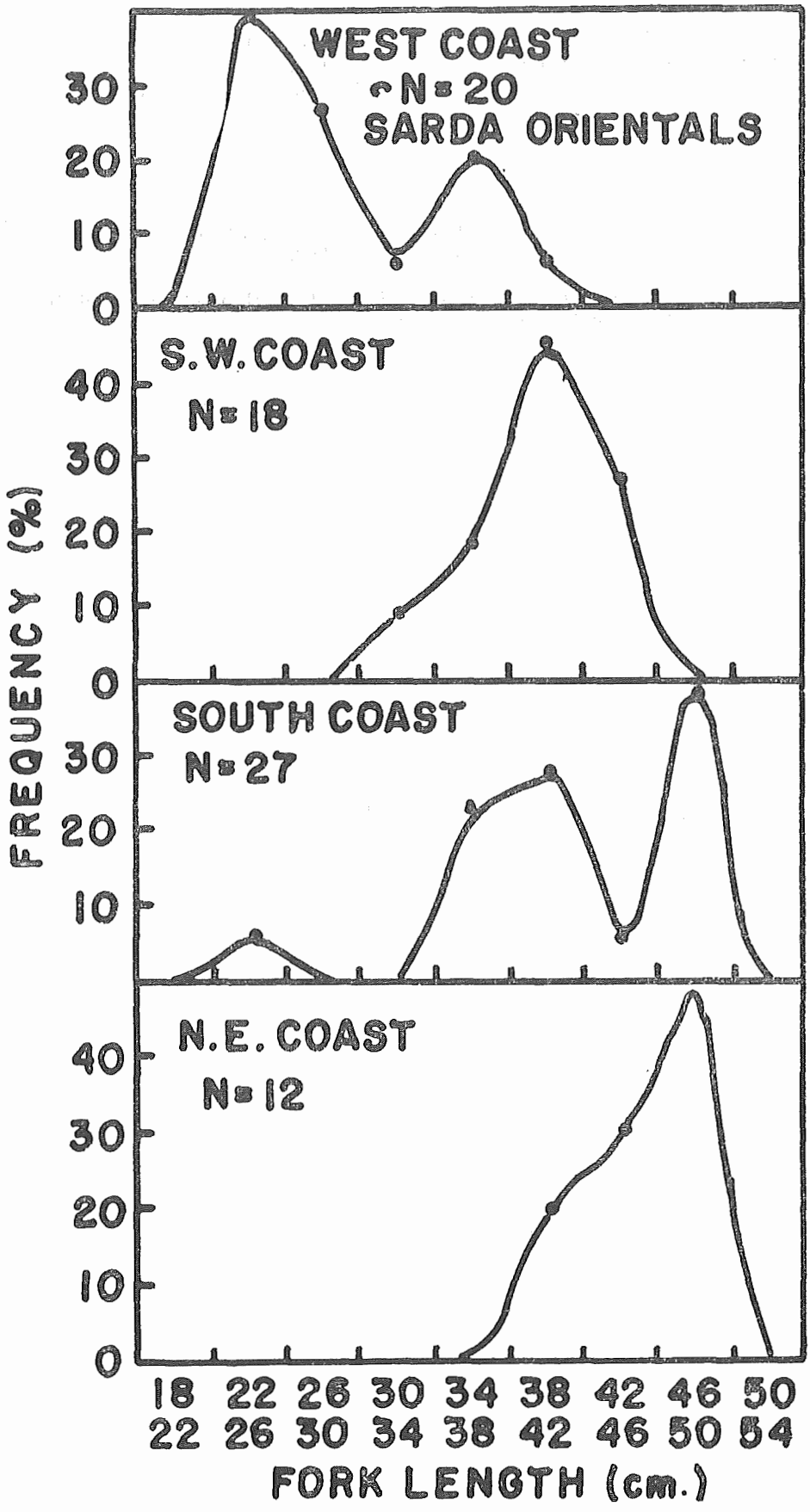

Fig. 1. Length-frequency distribution o *Sarda orientalis* around Ceylon (1967-68).

Plate I